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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------------|-------------|----------------------|---------------------|------------------|
| 10/664,547 | 09/19/2003 | Theodore W. Houston | TI-32205.1 | 4290 |
| 23494 | 7590 | 03/27/2006 | EXAMINER | |
| TEXAS INSTRUMENTS INCORPORATED | | | LEWIS, MONICA | |
| P O BOX 655474, M/S 3999 | | | ART UNIT | |
| DALLAS, TX 75265 | | | PAPER NUMBER | |
| | | | 2822 | |

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/664,547 | Applicant(s) HOUSTON, THEODORE W. | |
| | Examiner Monica Lewis | Art Unit 2822 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 49-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 49-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment filed January 9, 2006.

Response to Arguments

2. Applicant's arguments with respect to claims 49-53 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 49-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Turner (U.S. Patent No. 5,357,132).

In regards to claim 49, Houston et al. ("Houston") discloses the following:

a) a dielectric layer (48) disposed between a substrate and a first metal layer (68)
(For Example: See Figure 9);

b) a trench defined by a recess in the dielectric layer (For Example: See Figure 9);

c) a first contact pillar (64) extending substantially from a top surface of the substrate to a bottom surface of the first metal layer (68) within the trench (For Example: See Figure 9); and

d) a capacitor formed in the trench overlying the first contact pillar such that the capacitor is formed at least in part on a side of the first contact pillar, and the first contact pillar is a plate of the capacitor (For Example: See Column 6 Lines 46-50).

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In regards to claim 50, Houston discloses the following:

a) a second contact pillar (62) extending substantially from a top surface of the substrate to a bottom surface of another portion of the first metal layer wherein the second contact pillar is substantially the same height as the first contact pillar (For Example: See Figure 9).

In regards to claim 51, Houston discloses the following:

a) the capacitor comprises a storage element of a memory cell (For Example: See Column 1 Lines 15-25).

In regards to claim 52, Houston discloses the following:

a) a storage node of the storage element comprises a first contact pillar (For Example: See Abstract).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 53 is rejected under 35 U.S.C. 103(a) as obvious over Turner (U.S. Patent No. 5,357,132) in view of Chen et al. (U.S. Patent No. 6,093,600) and Fisher et al. (U.S. Patent No. 5,962,885).

In regards to claim 53, Houston fails to disclose the following:

a) a storage node further comprises a conducting layer lining the trench and the side of the first contact pillar.

However, Fisher et al. ("Fisher") discloses the use of a storage node further that comprises a conducting layer (80) lining the trench and the side of the first contact pillar (70) (For Example: See Figure 6). It would have been obvious to one having ordinary skill in the art

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at the time the invention was made to modify the semiconductor device of Houston to include storage node that comprises a conducting layer lining the trench and the side of the first contact pillar as disclosed in Fisher because it aids in increasing capacitance (For Example: See Column 1 Lines 51 and 52).

Additionally, since Houston and Fisher are both from the same field of endeavor (semiconductors), the purpose disclosed by Fisher would have been recognized in the pertinent art of Houston.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300 for regular and after final communications.

ML
March 16, 2006



Mary Wilczewski
Primary Examiner